

The Croonian Lecture. On the Changes the Blood undergoes in the act of Coagulation. By Sir Everard Home, Bart. V.P.R.S. Read November 20, 1817. [Phil. Trans. 1818, p. 172.]

After paying a tribute of applause to the talents of Mr. Bauer, as a microscopical observer, the author proceeds to estimate the size of the globules in human blood, 16 of which, when enveloped in their colouring matter, occupy the space of the 160,000th part of a square inch, so that 2,560,000 would be required to cover the superficial inch; but when the colouring matter is removed, 25 occupy the 160,000th part of an inch, which gives 4,000,000 to the square inch. The readiness with which the colouring matter is removed by the action of water, and its large relative quantity compared to the globule (being as about 3 to 1), induce the author to believe that the colouring substance is distinct from and not contained in the globules, but that it merely envelops them. The globules of the blood are not of the same appearance in all animals: in the skate they are of an oval form, and about twice as large as those in human blood, and quite independent of the colouring matter.

When the globules in the human blood have discharged their colour, they coalesce by mutual attraction into various forms, represented in a drawing annexed to the paper. In one instance four globules united so as to form a line with lateral indentations. The author, struck with the analogy between this appearance and that of a single muscular fibre, was induced to request Mr. Bauer to endeavour to unravel a muscle, so as, if possible, to compare its ultimate fibre with the chain of adhering globules. In this attempt he succeeded; and the appearances under the microscope, which were analogous, were given in an annexed drawing. It was further found that by macerating muscular fibre it might be broken down into colourless globules of the same size and appearance as those of the blood.

Having adduced these and other proofs and observations in favour of the ultimate muscular fibre being formed of the colourless globular particles of the blood, and having noticed the globular structure of the fibres of the brain, the author proceeds to consider in what manner the blood, in the act of coagulation, acquires the tubular texture, which fits it, when extravasated in living animals, to open a communication with the circulation, and afterwards to become a part of the solids of the animal.

Guided by some curious observations of Mr. Bauer on the formation of the tubular structure of plants, Sir Everard was induced to believe that the extrication of air, during the coagulation of the blood, might have an important influence upon its subsequent texture, and therefore observed what happened during the coagulation of a drop of blood in the field of the microscope. At first a film of coagulum formed upon the surface, air was then disengaged, which passed in every direction through the serum, without interfering with the globules, and formed a beautiful net-work of anastomosing

canals. Of this appearance an exact representation is given in annexed drawings. It explains, says the author, the important change which the blood undergoes after extravasation in living animals, and leaves no difficulty in accounting for its becoming vascular by receiving the red blood into the tubes thus prepared.

The author concludes his lecture by acknowledging his obligations to the unexampled zeal and exertions of the President in promoting and facilitating scientific pursuits. It was under his encouragement, and in compliance with his wishes, that Mr. Bauer, laying aside for the time his customary researches in vegetable anatomy, turned his attention to the subject of the present communication, and assisted in bringing those appearances to light, which, without his aid, must still have remained in obscurity.

Some Additions to the Croonian Lecture, on the Changes the Blood undergoes in the Act of Coagulation. By Sir Everard Home, Bart. V.P.R.S. Read March 5, 1818. [Phil. Trans. 1818, p. 185.]

The object of this paper is to furnish a more correct measurement of the globules of the blood than that formerly offered, and to establish, by additional facts, the author's opinion respecting the formation of tubes during the coagulation of the blood. The diameter of a globule of blood, as ascertained by Mr. Bauer, was considered as $\frac{1}{1000}$ th of an inch; whereas it appeared, from the more correct investigations of Capt. Kater, to be only $\frac{1}{1000}$ th. To show that the extraction of air was the cause of the tubular structure observed in coagulated blood, the author placed a portion of recently drawn blood under the receiver of an air-pump; and when it had coagulated, the air having been thus previously removed, no tubular appearance was manifested. In a portion of the same blood, coagulated previous to the exhaustion of the air, the tubuli were beautifully distinct. The author succeeded in injecting these tubuli by placing some fine size injection upon a piece of coagulum, and putting it under the receiver of the air-pump: during exhaustion the air escaped, and on its re-admission into the receiver the injection was forced into the tubular structure. Sir Everard next proves that coagula of blood, formed in the abdomen, may be injected from the contiguous vessels; and on microscopic examination it is shown, that the small arteries of the peritoneum enter the tubuli of the coagulum, and that the latter form vessels larger than the former; and that there are lateral points of communication between the tubuli and arteries. Sir Everard next relates some experiments upon pus similar to those upon the blood,—a fact, he observes, of much importance in practical surgery; for knowing that inspissated pus becomes vascular similar to coagulated blood, we have arrived at the principle on which granulations are formed, and whence they observe their inherent power of contraction. We can also account for the advantage of compressing the surface of sores; since by that means, continues the author, all superfluous pus is removed, leaving only enough for inspissation, in which state it